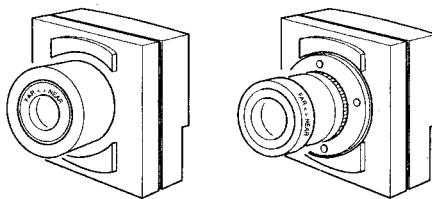


**Service
Service
Service**

V25106



CL 66610005_301A AI

CL 66610005_301B AI

NORTH-AMERICAN MODELS:
Service Manual: 8098

Service Manual

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**PHILIPS**

1. Introduction

These VM7-Cam is a family of CCD Colour Observation Cameras which is derived from the X1-C family.
This VM7-Cam family covers following type of cameras:

VCM7137/00T	fixed lens 4 mm F1.2
VCM7177/00T	CS lens 4 mm F1.2
TC71375T	fixed lens 4 mm F1.2
TC71775T	CS lens 4 mm F1.2
VC71375T	fixed lens 4 mm F1.2
VC71775T	CS lens 4 mm F1.2

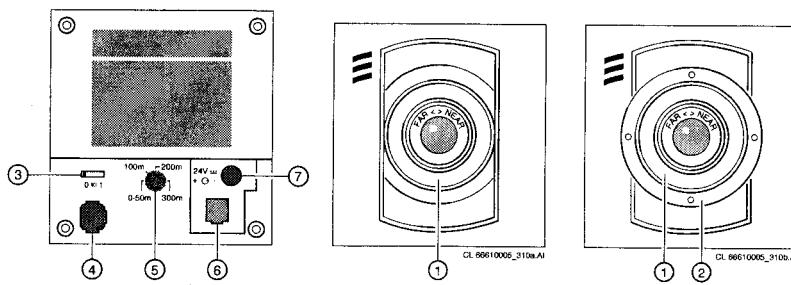
All the cameras can be used in combination with a protecting cover (VCM1152).

2. Technical Data

Power supply voltage	24 V DC , as supplied by the observation system monitor, connected with max. 200 m / 600 ft or 300 m / 900 ft (via external power).
Power consumption	≤ 3 W
Ext. Power source	Any approved DC voltage generator of 24 V DC, 500 mA in case that the cable length exceeds 200 m / 600 ft.
System cable	4-wire twisted pair of telephone cable (16 Ω/0100 m) (25 m included in the carton).
Video output	2-wire interface via system cable. differential mode 175 mVpp.
Sound output	2-wire interface via system cable. common mode 500 mVpp.
Microphone	Built in, electret (can be switched off at the camera).
Synchronization	Automatically to the monitor
Pick up element	1/3" Solid state CCD NTSC : LZ23132 PAL : LZ23232
Picture elements	512(H) x 492(V) for NTSC 512(H) x 582(V) for PAL
Resolution	330 TVL
Iris	Electronic and DC controlled auto Iris lens.
Gain control	Automatic 20 dB.
Light sensitivity	
• for fixed lens:	8.3 lux, 50 IRE (-6dB) at F2.0, 3200K (lens transmission 86%, scene reflection 100%)
• for CS mount lens:	3.0 lux, 50 IRE (-6dB) at F1.2, 3200K (lens transmission 86%, scene reflection 100%)

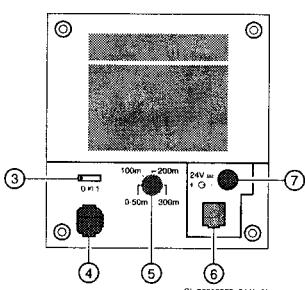
Lens	Fixed lens	CS-mount
Mounting	—	CS standard
Image format	1/3"	1/3"
Focal length	3.8 mm	4 mm
Angles of view	73 deg.	61 deg. horizontal
	54.8 deg	48 deg. horizontal
Relative aperture	F2.0	F1.2
Focus	1m-infinity	adjustable
Dimensions (HxWxD)	72 x 70.5 x 69.5	72.5 x 70 x 60
Weight	183.5 gr.	190 gr.
Ambient temperature		
Operating	-10° to +50° Centigrade.	
Storage	-25° to +70° Centigrade.	
Ambient humidity		
Operating	20 to 90 % RH	
Storage	up to 99 % RH	
Service policy	First line service: Board swapping using simple diagnoses, see chapter 11 for the details. Second line service: Central repair at factory, see chapter 7 for the details.	

3. Control Functions



1. Focus ring
2. Back focus ring
3. Sound on/off switch
4. cable length selector

4. Connections



4. Auto iris socket
5. System cable socket
6. External power socket
7. External power socket

5. Warnings and notes

WARNINGS

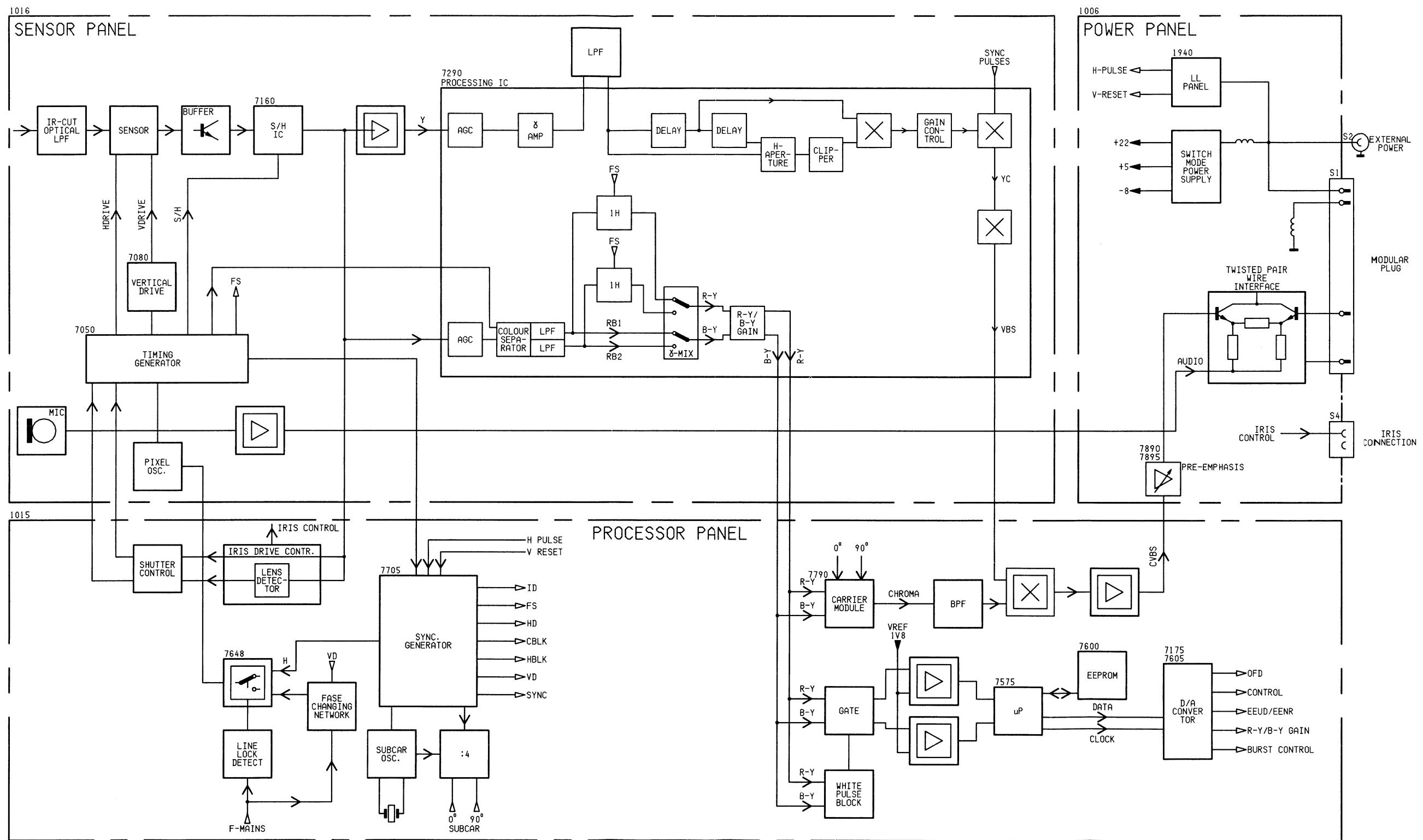
1. NEVER measure directly at the output of the CCD image sensor.
It will destroy the sensor immediately.
2. Safety regulations require that the unit should be returned in its original conditions and that components identical to the original components are used. The safety components are indicated by the symbol ▲
3. All ICs and many other semi-conductors are sensitive to electrostatic discharges (ESD). ▲
Careless handling during repair can drastically shorten the life. Make sure that during repair you are connected by a pulse band with resistance to the same potential as the earth of the unit.
Keep components and tools also at this same potential.
4. When making settings, use plastic rather than metal tools. This will prevent any short-circuit and the danger of a circuit becomes unstable.
5. Always switch off the set before replacing any of the components or separating the PW boards.
6. Never aim the camera at the sun or other extremely bright light sources.

NOTES:

1. This manual is prepared for all types of cameras (known at this moment) within this VM7-Cam (derived from the X1- C family range).
The types are mentioned in the Introduction chapter.
This manual support the board swapping repairs.
2. For alignments please order and refer "Alignment Software Guide" for X1-Colour camera, service code is 4822 727 20001. This guide also includes the software on 3.5" floppy.
A brief description is also presented in this manual.
3. Be attentive at the cable (item 53) connecting connectors P3 on processor board and S3 on power board.
The cable can be connected in both directions.
The correct way to connect the cable is that the blue indication of cable should be visible from top while inserting it in connector P3 on processor board. Then the cable should be connected to S3 on power board without any bend. The blue indication of cable on power board side will be at bottom side.
If the cable is wrongly connected the camera will not function but there will be no damage.
4. In order to remove the power board, desolder the external power socket S2, because it is screwed into the backcover (inside).
The Power Board can be now taken out.
Before start repairing connect short circuit pin 2 and 3 of plug S2 on the power board !!

6. Block diagram

VCM 7137/00T 4



66630014/02, X001
19 0996

7. Service policy

The Service policy for this product is : board swapping (for sensor & processing panels) as first line service. It means only replacement of the defective board. In case of necessary repairs, the defective "repairable" boards must be returned to Philips Consumer Service according the central repair procedure.

This camera type contains one assembly, which can be repaired centrally via the so called "central repair procedure".

The relevant panels are mentioned under the heading "Repairables" in chapter 12 (spare parts list). The central repair procedure has been introduced to guarantee a fast, efficient and correct repair of panels or assemblies with complex circuitries or new technologies.

8. Service board

The service board 4822 212 30881 serves two functions:

1. An interface board between the computer and camera panels for electrical adjustments.
2. The extension board to do various measurements and repair on different panels.

The processor panel is to be connected to 22 pins male connectors on the service board and Sensor assembly to 22 pins female connectors. These panels can be tightened by means of screws and nuts provided along with the service board.

The Power board being connected to the processor panel should be also tightened by means of screws for mechanical stability. The service board can be connected to computer via RS232 9-PIN D- Shell connector S8.

The LED on the service board indicates the right connection and supply. If it does not glow, check the connections and supply.

Signal descriptions:

HBLK	Horizontal blanking pulse
VD	Vertical drive Pulse
HD	Horizontal drive pulse
WBLK	Wide blanking pulse
PBLK	Pre-blanking pulse
CBLK	Composite blanking pulse

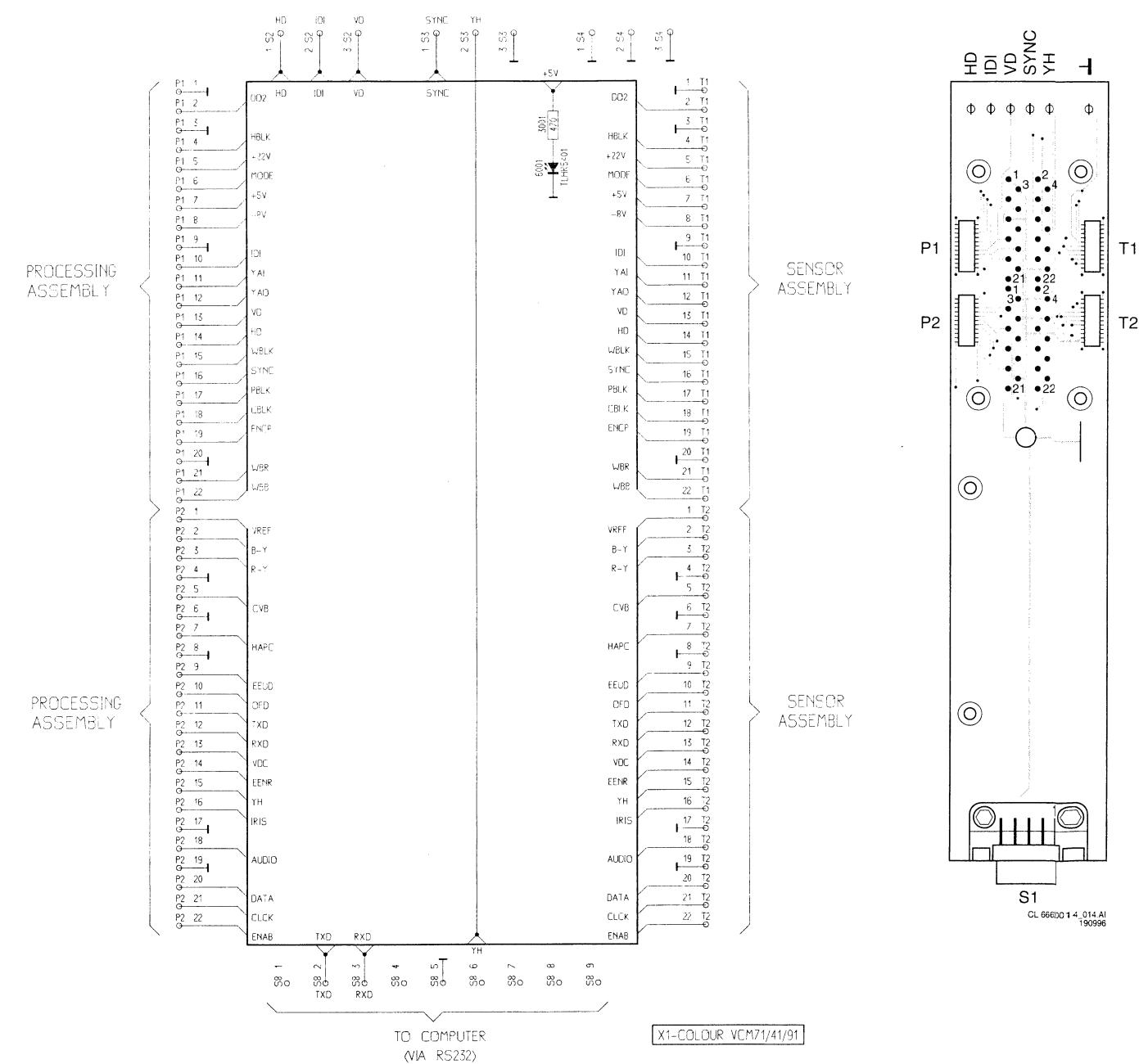
Central Repair Procedure:

Contact your local service organisation to obtain a repairable board. After confirmation a replacement panel or assembly will be sent to you. Send the defective panel or assembly inclusive a "(standard) repair form" to your local service organisation. The defective panel should be correctly packed inclusive ESD protecting material. The original packing of the returned/replacement panel can be used for this purpose.

The accompanying "repair form" should contain all basic information such as:

- full model number of the set
- date of failure
- reporting country
- serial number/production code of the set
- description of the failure including timing indication (immediate, after ... minutes warming up, sometimes)

Service board

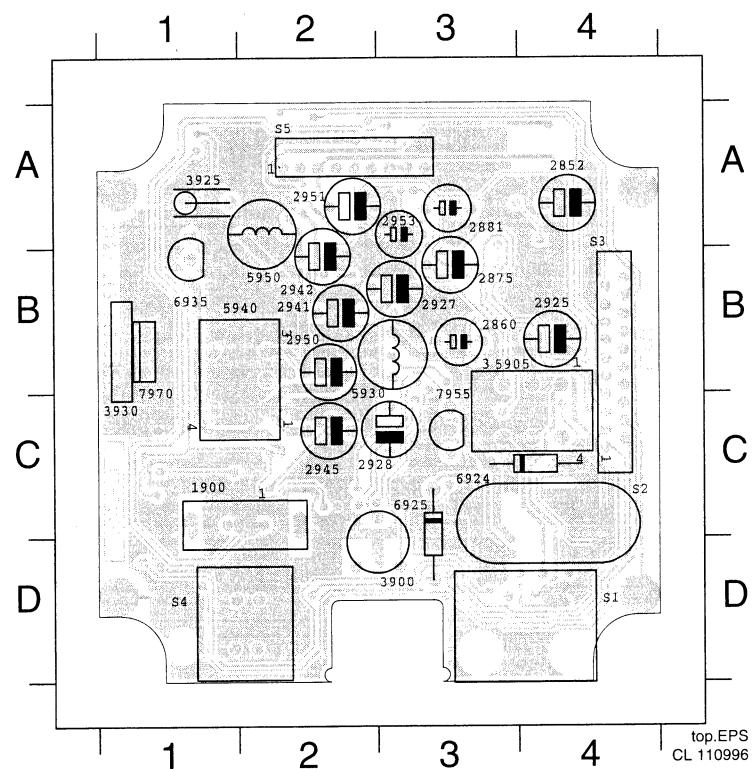


9. Power panel board

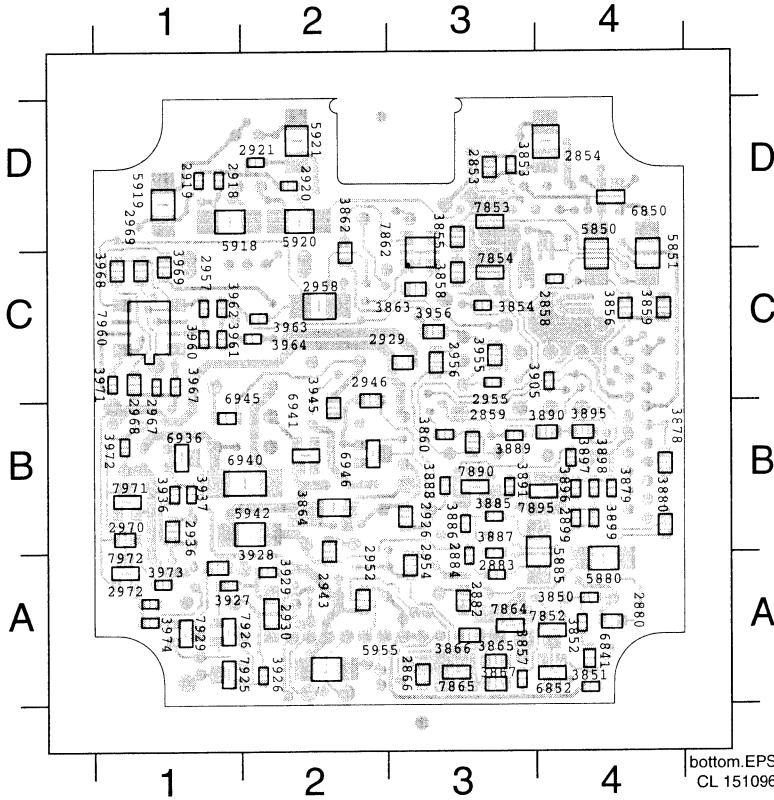
VCM 7137/00T 6

6

Component side



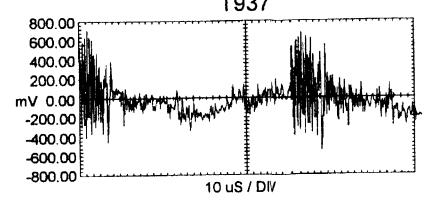
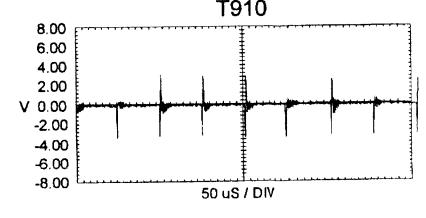
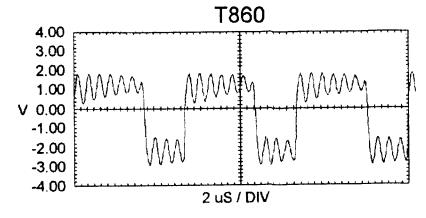
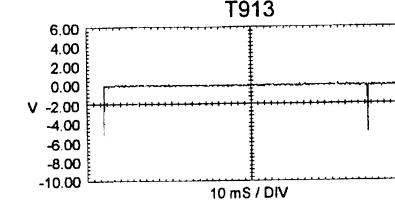
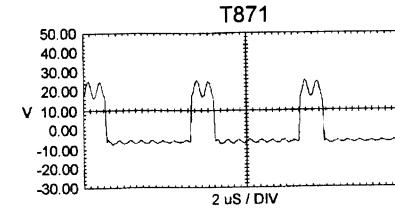
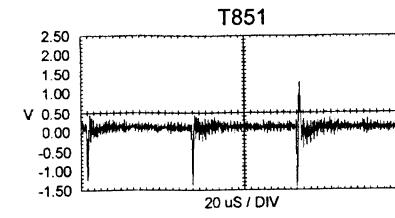
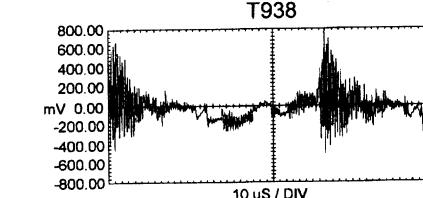
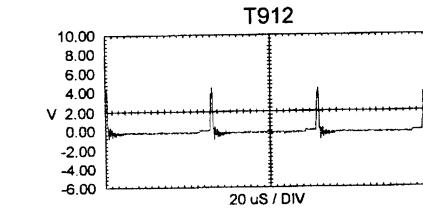
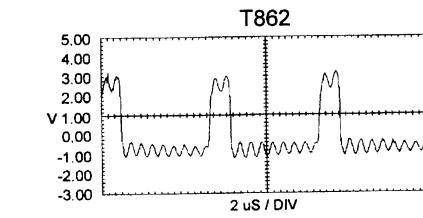
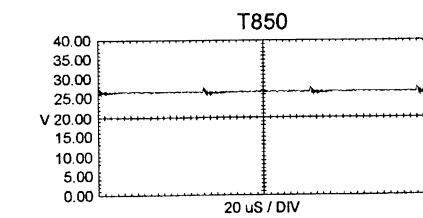
SMD-side



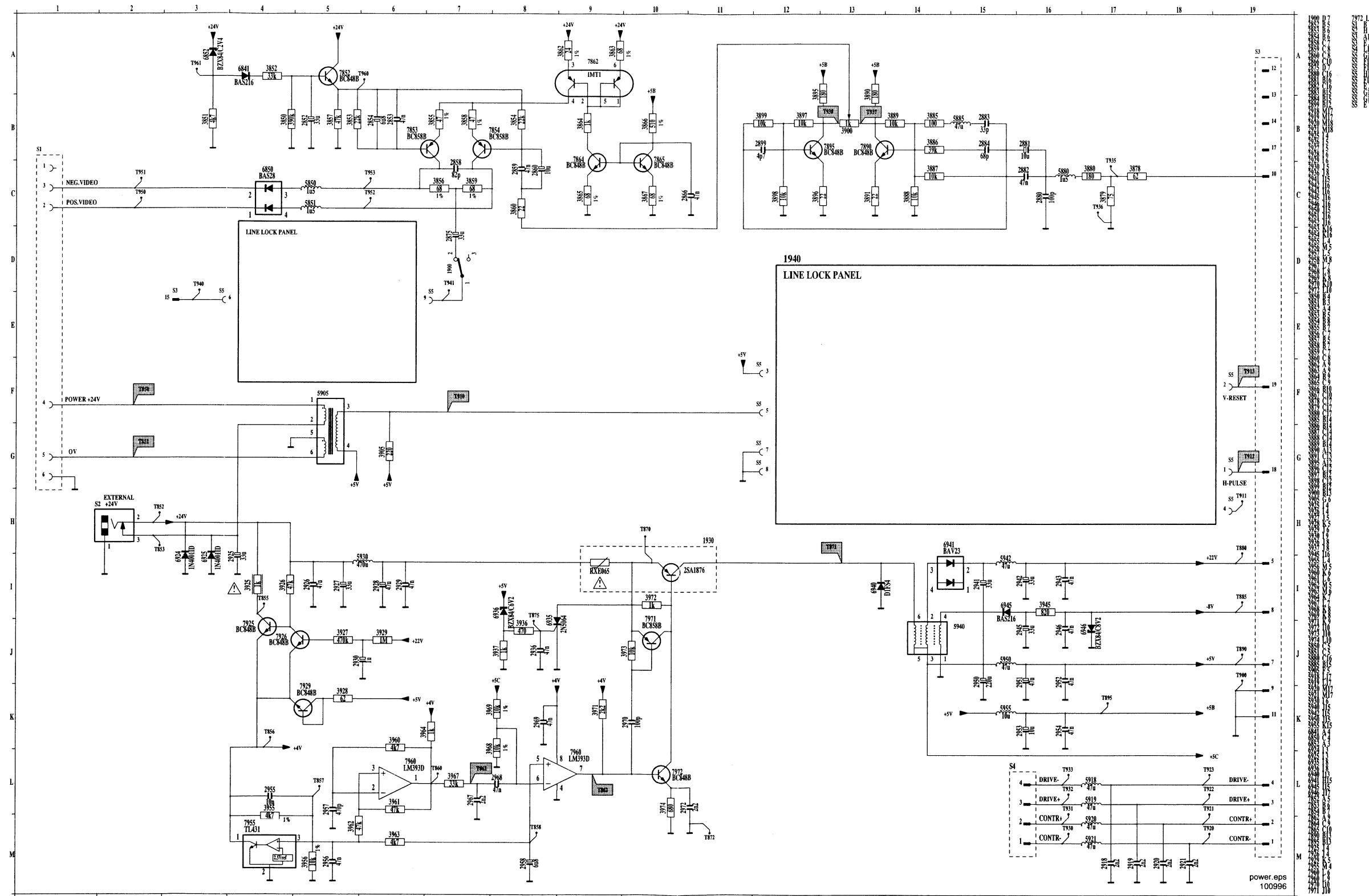
1900	C1
2852	A4
2860	B3
2875	B3
2881	A3
2925	B4
2927	B3
2928	C2
2941	B2
2942	B2
2945	C2
2950	B2
2951	A2
2953	A3
3900	D3
3925	A1
3930	B1
5905	B3
5924	C3
5930	B2
5940	B1
5950	B2
6925	C3
6935	B1
7955	C3
7970	B1
S1	D4
S2	C4
S3	B4
S4	D1
S5	A2

2853	D3	3858	C3	3967	C1
2854	D4	3859	C4	3968	C1
2858	C4	3860	B3	3969	C1
2859	B3	3862	D2	3971	C1
2866	A3	3863	C3	3972	B1
2880	A4	3864	B2	3973	A1
2882	A3	3865	A3	3974	A1
2883	C3	3866	A3	5850	D4
2884	A3	3867	A3	5851	C4
2899	B4	3878	B4	5880	A1
2918	D1	3879	B4	5885	A4
2919	D1	3880	B4	5918	D1
2920	D2	3885	B3'	5919	D1
2921	D2	3886	B3	5920	D2
2926	B3	3887	B3	5921	D2
2929	C3	3888	B3	5942	B2
2930	A2	3889	B3	5955	A2
2936	B1	3890	B4	6841	A4
2943	A2	3891	B3	6850	D4
2946	C2	3895	B4	6852	A4
2952	A2	3896	B4	6936	B1
2954	A3	3897	B4	6940	B2
2955	C3	3898	B4	6941	B2
2956	C3	3899	B4	6945	C1
2957	C1	3905	C3	6946	B2
2958	C2	3926	A2	7852	A4
2967	B1	3927	A1	7853	D3
2968	B1	3928	A2	7854	C3
2969	D1	3929	A2	7862	D2
2970	B1	3936	B1	7864	A3
2972	A1	3937	B1	7865	A3
3850	A4	3945	C2	7890	B3
3851	A4	3955	C3	7895	B4
3852	A4	3956	C3	7925	A2
3853	D3	3960	C1	7926	A2
3854	C3	3961	C1	7929	A1
3855	D3	3962	C1	7960	C1
3856	C4	3963	C2	7971	B1
3857	C3	3964	C2	7972	A1

Cameras



Power panel circuit



10. Electrical Adjustments

The alignments are done by means of software which can be used on any AT, XT or notebook computer. For detailed description of alignments please refer "Alignment Software Guide" for X1-Colour camera, service code is 4822 727 20001. This guide also includes the software on 3.5" floppy. However, a simple method has been worked out to use the factory aligned panels with very little work. This will save tremendous time. The method is described here as follows:

- The factory will provide the aligned sensor assembly (with opto-block) and processing panel.
- The aligned panels have different D/A converters (DACs) filled with certain decimal values.
- The sensor assembly will be provided along with hard copy of all the DACs values. The DACs associated with Sensor assembly's alignment are marked with *.
- The processor assembly will be also aligned but no hard copy of values will be provided. All the DACs values are stored in EEPROM, item no. 7800 on processor panel.

Case 1: Sensor assembly is defected, but processor assembly is o.k.

- Replace the defected sensor assembly by repaired one.
- Load the alignment software. Refer the alignment software guide instructions.
- Then enter the values of DACs bits 03, 12, 13, 15, 16, 17, 19, 20, 21, 22 & 23 (marked with *) as mentioned on the paper provided along with the assembly. These DACs bits are associated with Sensor assembly alignment.

Case 2: Processor panel is defected but the EEPROM 7800 is o.k.

- Load the alignment software program and read the DACs bits values as described in the software guide.
- Take the print out of these values.
- Replace the defected processor panel by the repaired one.
- Using software enter the old values of DACs marked with * on your print out i.e. of DACs bits 03, 12, 13, 15, 16, 17, 19, 20, 21, 22 & 23.

Case 3: If EEPROM 7800 is defected then you can not read the old values of sensor-associated DACs bits. Then you have to do the alignments yourself for these DACs bits. These alignments are described in the "Alignment Software Guide" for X1-Colour camera, service code is 4822 727 20001.

Note: The defect in EEPROM can be diagnosed by the alignment software on loading the program while different panels connected via service board.

11. Fault Diagnosis

The fault diagnosis is made on board level. Letters V,W,X,Y,Z will be used as reference in the fault finding flow chart. First always check the LED on the service board. If it does not glow check different camera panels' connections on service board, and power supply.

Note: Measurements on various connector pins can be also done on the Service Board (4822 212 30881).

Sensor defect:

V: Check the pulses and DC-levels on the pins of the sensor (pins 1-16) item 7025.
 Pin 1: RS-pulse 9.5 MHz 4-8.5 V,
 Pin 2: DC 15 V,
 Pin 3, 14: ground,
 Pin 4: sensor output (DC=10 V),
 Pin 5: DC 15 V,
 Pins 6,7,8,9: HF-PULSE (0-5 V),
 Pins 10, 12: Line Frequent pulse (0-(-8)V
 Pins 11, 13: Line + Frame Frequent pulse (0-(-8 V)-17 V
 If any signal is missing, the sensor 7025 is defected.

Sensor board defect:

W: If the following timing pulses are present it shows the processor board is ok.
 - IDI on connector 10-T1 Line frequency/2 pulse
 - PBLK on connector 17-T1 Line frequency pulse
 - ENCP on connector 19-T1 Line frequency pulse
 - CBLK on connector 18-T1 Line frequency pulse
 - SYNC on connector 16-T1 line frequency pulse
 - VD on connector 13-T1 field frequent pulse

X: and now if the signal on one of the following test points is missing the defect is on the sensor board:
 - Luminance on connector 15-T2, 5-T2, TP234 929-7290
 - Chrominance on connector 3-T2, 2-T2
 - Iris on connector 16-T2 (video signal of approx. 1Vpp on 1.8 Vdc)
 - 9.5 MHz clock on connector 2-T1

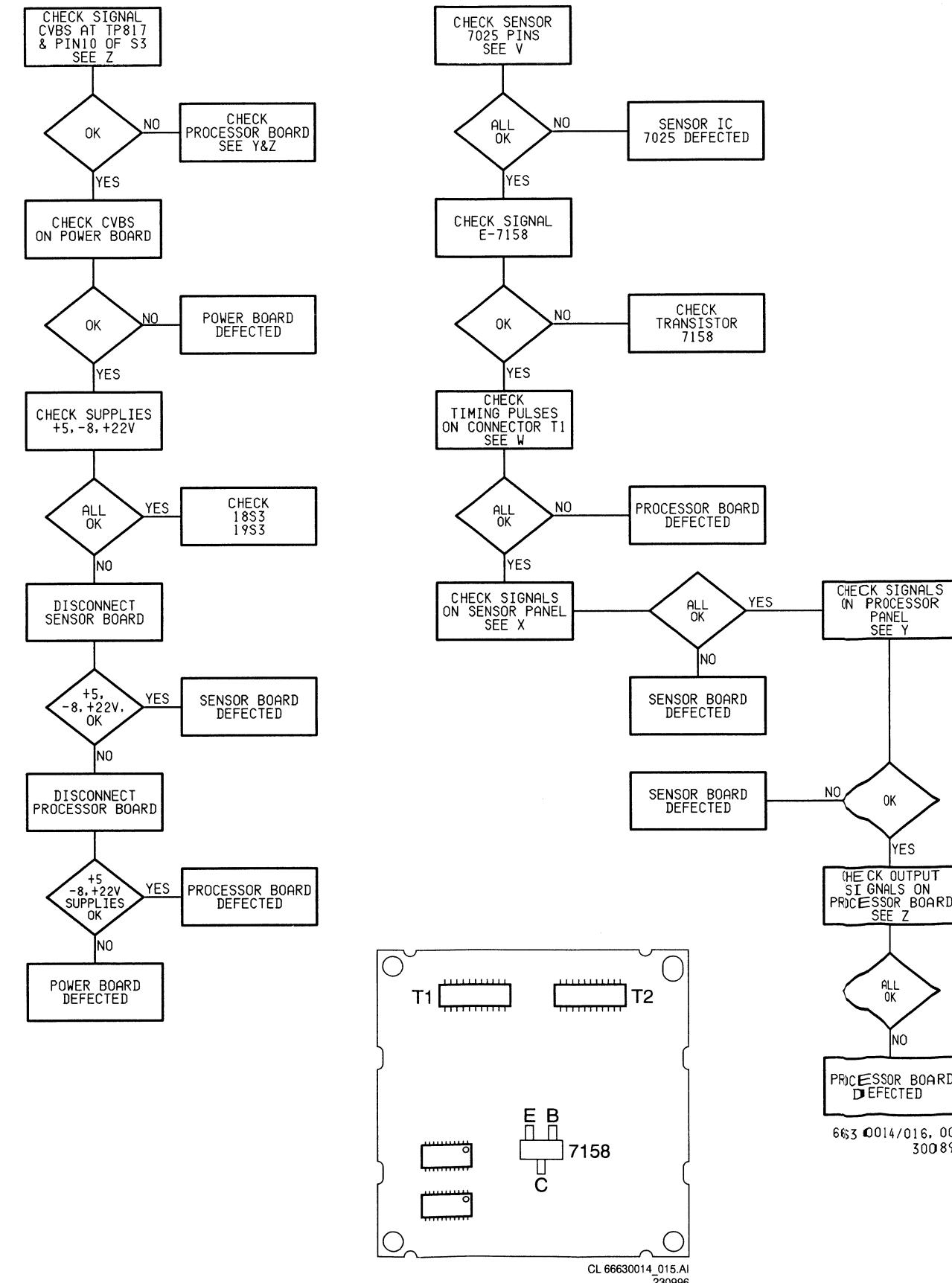
Processor board defect:

Y: If the signals on following test points are present it shows Sensor Board is ok.
 - Luminance on connector 15-P2
 - Chrominance on connector 3-P2 and 2-P2
 - Iris on connector 16-P2
 - 9.5 MHz clock on connector 2-P1

Z: and now if no signal is present on one of following test points the processor board is defective.
 - CVBS on connector 11-P3
 - Chroma on connector 2-P5
 - U on connector 1-P5 (only 4170)
 - V on connector 6-P5 (only 4170)

Further if one of the timing pulses mentioned above is missing also the fault is on the processor board.

Fault FINDING tree(S) on board level



Power board defect:

If the signal on the connector 11-P3 and 10-S3 is present, but no output signal at S1 connector then the problem is on the power board.

If one of the three DC-voltages; +5V (on connector 7-P1), -8V (on connector 8-P1) and +22V (on connector 5-P1) is missing then do the following actions.

First disconnect sensor board;
* problem is solved → sensor board is defective.

If not, disconnect processor board;
* problem solved → processor board is defective.

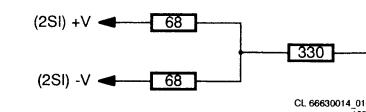
If the problem still remains → power board is defective.

- If the camera does not function, check if the cable (item 53) is correctly connected between connectors P3 on processor board and connector S3 on power board. Please see under NOTES (point 3) for the correct connection.

Personal Notes:**Note:**

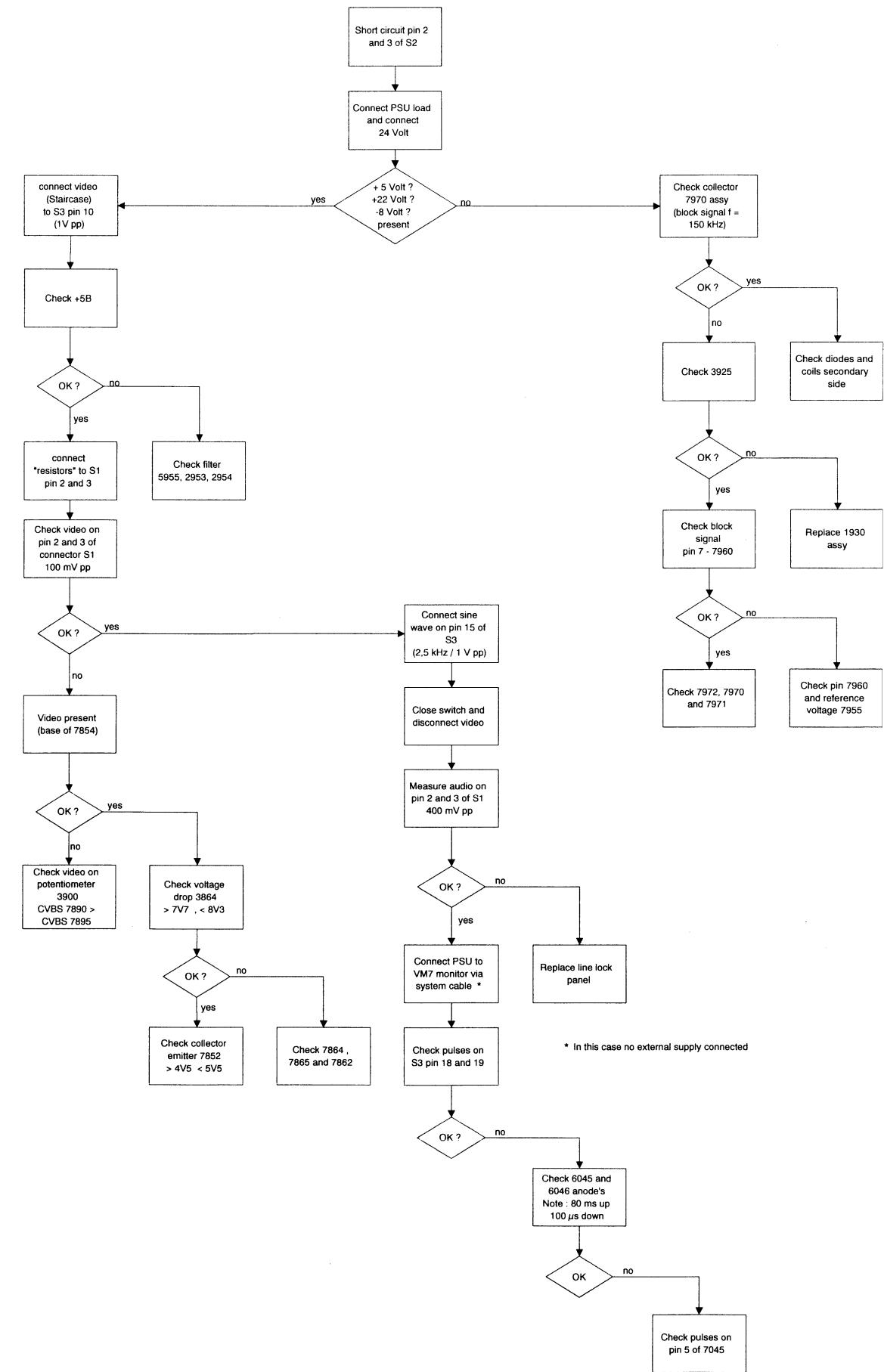
To check / repair the power board (as stand alone board) the following tools are needed:

- load resistors;
- 18R for the +5V (7S3)
- 1k1 for the +22V (5S3)
- 10k for the -8V (8S3)
- a resistor network



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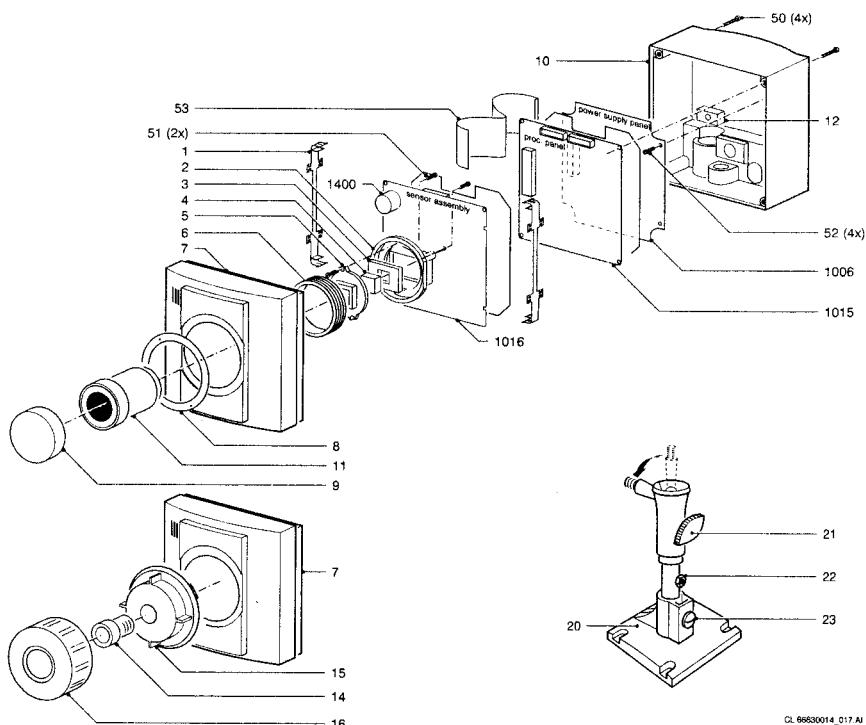
- a VM7 observation monitor (e.g. VSS7370/00T)
- a video pattern generator
- the X1C service test board (4822 212 30881)

Fault finding tree power board

12. Spare Parts Lists

VCM 7137/00T

10



C:\6563D014.013.M

POSITION NUMBER	SERVICE CODE	DESCRIPTION	POSITION NUMBER	SERVICE CODE	DESCRIPTION
1	4822 404 31296	Spacer			REPAIRABLES:
2	4822 255 70286	Sensor interface block			These unit can be returned to PCS for repairing at factory, see chapter 7.
3	4822 466 62405	Gasket			
4	4822 381 20181	Optical low-pass filter	1015	4822 214 11846	Processor panel assy (PAL)
5	4822 432 60782	Mask	1015	4822 214 11837	Processor panel assy (NTSC)
6	4822 532 12249	Adaptor-ring	1016	4822 214 11839	Sensor panel assy (PAL- fixed)
7	4822 432 60777	Housing front part	1016	4822 212 31734	Sensor panel assy (PAL- CS)
8	4822 532 12251	Retaining-ring	1016	4822 214 11835	Sensor panel assy (NTSC-fixed)
9	4822 462 71776	Dust cap	1016	4822 212 31735	Sensor panel assy (NTSC-CS)
10	4822 441 11811'	Housing back part			AUXILIARY TOOLS
11	4822 381 11473	CS lens 4 mm F1.2			
12	4822 265 10753	Power jack S2	4822 321 21988		RS232 cable 9p male-female 1 meter
13	4822 466 11333	Optical block assy (VCM7137/..)	4822 321 22822		RS232 cable 9p male-female 3 meter
13	4822 466 11334	Optical block assy (VC71375T-TC71375T)	4822 212 30881		Service board complete
13	4822 218 11521	Optical block assy (VCM7177/..)	4822 727 20001		Alignment software guide with floppy
13	4822 218 11519	Optical block assy (VC71775T-TC71775T)			
14	4822 381 11699	Fixed lens 4 mm			
15	4822 466 11335	Lens interface			
16	4822 462 10806	Lens cap			
20	4822 462 10507	Tripod assy- grey			
21	4822 413 41884	Knob for tripod- grey			
22	4822 502 21582	Screw M5*8 for tripod			
23	4822 505 10665	Lock nut M5 for tripod			
50	4822 502 13887	Torx screw 2*20 (4*)			
52	4822 502 13886	Screw 2*6 (4*)			
53	4822 323 50158	Cable P3-S3			
Various:					
	4822 321 62696	Camera cable 15 meter			
T1	4822 265 51361	22 pins connector			
T2	4822 265 51361	22 pins connector			
P1	4822 267 60364	22 pins connector			
P2	4822 267 60364	22 pins connector			
P3	4822 267 60365	20 pins connector			
1400	4822 242 30176	Microphone			

POWER PANEL PARTS				
1006	4822 214 11842 POWER PANEL			
Various				
S1	4822 267 41183 4 pins connector			
S3	4822 265 51362 20 pins connector			
S4	4822 267 41109 4 pins connector			
S5	4822 265 10754 9 pins connector			
1900	4822 277 21765 AUDIO SWITCH			
1930	4822 117 12567 TRANSISTOR-RE			
1940	4822 214 11844 SISTOR ASSY LINE LOCK PANEL			
-II-				
2852	4822 124 42058 33μF 20% 50V	3860	4822 051 30229 22Ω 5% 0.062W	
2853	4822 126 12944 47nF 10% 50V	3862	4822 117 12522 24Ω 1% 0.1W	
2854	4822 124 80653 6.8μF 20% 6.3V	3863	4822 117 12521 68Ω 1% 0.1W	
2858	4822 122 33788 82pF 5% 50V	3864	4822 051 10102 1K 2% 0.25W	
2859	4822 126 12944 47nF 10% 50V	3865	4822 117 12521 68Ω 1% 0.1W	
2860	4822 124 41579 10μF 20% 50V	3866	4822 117 11597 51Ω 1% 0.1W	
2866	4822 126 12944 47nF 10% 50V	3867	4822 117 12521 68Ω 1% 0.1W	
2875	4822 124 42058 33μF 20% 50V	3878	4822 117 11496 62Ω 1% 0.1W	
2880	5322 122 32521 100pF 5% 50V	3879	4822 051 30750 75Ω 5% 0.062W	
2881	4822 124 41579 10μF 20% 50V	3880	4822 117 11448 180Ω 1% 0.1W	
2882	4822 126 12944 47nF 10% 50V	3885	4822 051 30101 100Ω 5% 0.062W	
2883	4822 126 11671 33pF	3886	4822 051 30393 39k 5% 0.062W	
2884	4822 122 33785 68pF 5% 50V	3887	4822 051 30103 10k 5% 0.062W	
2899	4822 126 13193 4.7nF 10% 63V	3888	4822 051 30103 10k 5% 0.062W	
2918	4822 126 13192 2.2nF 10% 63V	3889	4822 051 30103 10k 5% 0.062W	
2919	4822 126 13192 2.2nF 10% 63V	3890	4822 117 11448 180Ω 1% 0.1W	
2920	4822 126 13192 2.2nF 10% 63V	3891	4822 051 30229 22Ω 5% 0.062W	
2921	4822 126 13192 2.2nF 10% 63V	3895	4822 117 11448 180Ω 1% 0.1W	
2925	4822 124 42058 33μF 20% 50V	3896	4822 051 30229 22Ω 5% 0.062W	
2926	4822 126 12944 47nF 10% 50V	3897	4822 051 30103 10k 5% 0.062W	
2927	4822 124 42058 33μF 20% 50V	3898	4822 051 30103 10k 5% 0.062W	
2929	4822 126 12944 47nF 10% 50V	3899	4822 051 30103 10k 5% 0.062W	
2930	4822 126 11219 1μF 20% 16V	3900	4822 101 11672 1K 0.3W	
2936	4822 126 12944 47nF 10% 50V	3905	4822 051 30221 22Ω 5% 0.062W	
2941	4822 124 42058 33μF 20% 50V	3925▲	4822 052 10102 1K 5% 0.33W	
2942	4822 124 42058 33μF 20% 50V	3926	4822 051 30473 47k 5% 0.062W	
2943	4822 126 12944 47nF 10% 50V	3927	4822 051 30474 470k 5% 0.062W	
2945	4822 124 42058 33μF 20% 50V	3928	4822 117 11496 62Ω 1% 0.1W	
2946	4822 126 12944 47nF 10% 50V	3929	4822 051 30105 1M 5% 0.062W	
2952	4822 126 12944 47nF 10% 50V	3936	4822 051 30471 470Ω 5% 0.062W	
2953	4822 124 41579 10μF 20% 50V	3937	4822 051 30102 1K 5% 0.062W	
2954	4822 126 12944 47nF 10% 50V	3945	4822 117 11454 820Ω 1% 0.1W	
2955	5322 126 11583 10nF 10% 63V	3955	4822 117 11145 4K 1% 0.1W	
2956	4822 126 12944 47nF 10% 50V	3956	4822 117 10833 10k 1% 0.1W	
2957	4822 126 12777 470pF 10%	3960	4822 051 30472 4K 5% 0.062W	
2958	4822 124 80653 6.8μF 20% 6.3V	3961	4822 051 30473 47k 5% 0.062W	
2967	4822 126 13192 2.2nF 10% 63V	3962	4822 051 30473 47k 5% 0.062W	
		3963	4822 051 30472 4K 5% 0.062W	
		3964	4822 051 30102 1K 5% 0.062W	
		3967	4822 051 30333 33k 5% 0.062W	
		3968	4822 117 10833 10k 1% 0.1W	
		3969	4822 117 10833 10k 1% 0.1W	
		3971	4822 051 30222 2K 5% 0.062W	
		3972	4822 051 30102 1K 5% 0.062W	
		3973	4822 051 30103 10k 5% 0.062W	
		3974	4822 051 30681 680Ω 5% 0.062W	
		3980	4822 157 11019 1U5 FIXED COIL	
		3981	4822 157 11019 1U5 FIXED COIL	
		3980	4822 157 11019 1U5 FIXED COIL	
		3985	4822 157 70794 47μH	
		5905	4822 146 10648 TRANSFORMER	
		5918	4822 157 70794 47μH	
		5919	4822 157 70794 47μH	
		5920	4822 157 70794 47μH	
		5921	4822 157 70794 47μH	
		5930	4822 157 71322 470μH	
		5940	4822 146 10649 TRANSFORMER	
		5942	4822 157 70794 47μH	
		5950	4822 157 11086 COIL	
		5955	4822 157 70778 COIL	
		6841	4822 130 83757 BAS216	
		6850	5322 130 80214 BAS28	
		6852	4822 130 33703 BZX84-C2V4	
		6924	4822 130 31438 1N4001GP	
		6925	4822 130 31438 1N4001GP	
		6935	4822 130 10243 2N5064	
		6936	4822 130 33707 BZX84-B6V2	
		6940	4822 130 83504 D1FS4	
		6941	5322 130 33764 BAV23	
		6945	4822 130 83757 BAS216	

Complaint description forms



FAULT DESCRIPTION FORM

Model number of the defective product :

Date of failure: .. - .. - 19..

Serial number of the defective product : A/OP.... 9.....

Country :

Fault description :

Please add this description form in the box with the defective panel !!



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